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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
FORMAN, BETTY J

ART UNIT	PAPER NUMBER
1634	

DATE MAILED: 08/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/997,475	RAMIREZ-VICK ET AL.	
	Examiner	Art Unit	
	BJ Forman	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 May 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

FINAL ACTION

1. This action is in response to papers filed 6 May 2003 in which claims 1, 8, 9 and 16 were amended. All of the amendments have been thoroughly reviewed and entered. The previous objections and rejections under 35 U.S.C. 112, second paragraph in the Office Action dated 6 November 2002 are withdrawn in view of the amendments. The previous rejections under 35 U.S.C. 102(e) and 35 U.S.C. 103(a) are withdrawn in view of the amendments. All of the arguments have been thoroughly reviewed but are deemed moot in view of the amendments, withdrawn rejections and new grounds for rejection. New grounds for rejection necessitated by amendments are discussed.

Claims 1-16 are under prosecution.

Specification

2. The amendment filed 6 May 2003 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

The attempt to incorporate subject matter into this application by reference to parent application 09/584,661 is improper because the incorporation by reference was not part of the specification as originally filed. While it is appropriate amend the specification to cross reference the parent application it is not appropriate to amend the specification to incorporate-by-reference the parent. Therefore, the incorporation by reference constitutes new matter.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-4 and 7-8 are rejected under 35 U.S.C. 102(e) as being anticipated by Blackburn et al (U.S. Patent No. 6,264,825, filed 23 June 1999).

Regarding Claim 1, Blackburn et al disclose a method for increasing the hybridization rate of nucleic acids in a sample comprising attaching probe nucleic acid molecules of known sequence to a solid support, labeling nucleic acid target molecule with paramagnetic beads, attracting the labeled targets to the solid support by activating a magnetic field effective to induce rapid migration of the target, hybridizing the labeled target with their complementary pairs at a hybridization rate greater than the rate in the absence of the attracting field, washing the support and inverting the polarity of the magnetic field to remove unbound molecules and detecting the hybridized targets (Column 6, lines 30-60; Column 9, lines 31-61; Column 21, lines 20-65; and Column 38, line 61-Column 39, line13).

Regarding Claim 2, Blackburn et al disclose the method wherein the solid support is selected from silicon, glass and metals (Column 14, lines 41-54).

Regarding Claim 3, Blackburn et al disclose the method wherein the solid support is coated with a metal selected from silver, copper gold, platinum, mercury, thallium, cadmium, and palladium (Column 14, line 41-Column 15, line 60).

Regarding Claim 4, Blackburn et al disclose the method wherein the paramagnetic labels have a diameter of from about 1 to about 10 nanometers (Column 21, lines 32-59).

Regarding Claim 7, Blackburn et al disclose the method wherein the nucleic acids are oligonucleotides, genomic DNA, cDNA, RNA or fragments thereof (Column 9, lines 11-30).

Regarding Claim 8, Blackburn et al disclose the method wherein at least one of the probe and target is labeled with a fluorescent detection molecule (Column 78, lines 25-35).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subjcct matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 5 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blackburn et al (U.S. Patent No. 6,264,825, filed 23 June 1999) in view of Roelant (U.S. Patent No. 6,001,573, filed 23 October 1997).

Regarding Claims 5 and 13, Blackburn et al disclose a method for increasing the hybridization rate of nucleic acids in a sample comprising attaching probe nucleic acid molecules of known sequence to a solid support, labeling nucleic acid target molecule with paramagnetic beads, attracting the labeled targets to the solid support by activating a magnetic field effective to induce rapid migration of the target, hybridizing the labeled target with their

complementary pairs at a hybridization rate greater than thc rate in the absence of the attracting field, washing the support and inverting the polarity of the magnetic field to remove unbound molecules and detecting the hybridized targets (Column 6, lines 30-60; Column 9, lines 31-61; Column 21, lines 20-65; and Column 38, line 61-Column 39, line13) wherein the magnetic beads are those known in the art (Column 21, lines 48-50) but they do not specifically teach the magnetic beads comprising porphyrins.

Roelant teach a similar method of nucleic acid hybridization comprising attaching probe molecules to a solid support; labeling target molecules with paramagnetic labels; contacting the labeled molecules with the solid support; and detecting the hybridized target molecules wherein the paramagnetic labels comprise paramagnetic porphyrins (Column 5, line 66-Column 6, line 16) wherein the porphyrin label provides a universal label which attaches irreversibly without bridging agents and can be detected in an amount which is proportional to the number of labeled particles (Column 3, lines 59-65). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to label the paramagnetic beads of Blackburn et al with the porphyrin label taught by Roelant for the expected benefit of irreversible attachment of the label and for the additional benefit of quantifying target simply by quantifying the label as taught by Roelant (Column 3, lines 59-65).

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blackburn et al (U.S. Patent No. 6,264,825, filed 23 June 1999) in view of Basalt (U.S. Patent No. 5,981,297).

Regarding Claims 6 and 14, Blackburn et al disclose a method for increasing the hybridization rate of nucleic acids in a sample comprising attaching probe nucleic acid

molecules of known sequence to a solid support, labeling nucleic acid target molecule with paramagnetic beads, attracting the labeled targets to the solid support by activating a magnetic field effective to induce rapid migration of the target, hybridizing the labeled target with their complementary pairs at a hybridization rate greater than the rate in the absence of the attracting field, washing the support and inverting the polarity of the magnetic field to remove unbound molecules and detecting the hybridized targets (Column 6, lines 30-60; Column 9, lines 31-61; Column 21, lines 20-65; and Column 38, line 61-Column 39, line13) wherein the nucleic acids are attached to the paramagnetic beads using known techniques (Column 19, lines 58-59) but they do not specifically teach cleavable conjugating attachment. However, Basalt teaches a similar method of nucleic acid hybridization comprising: attaching probe nucleic acid molecules of known sequence (i.e. binding molecules capable of undergoing selective binding with a target species, Column 4, lines 20-24)to a solid support; labeling nucleic acid target molecules with paramagnetic labels; contacting the labeled target molecules with the solid support; activating a magnetic field whereby the labeled molecules are attracted to the solid support (Column 7, lines 21-37); washing the support and inverting the polarity of the magnetic field to remove any unbound or non-specifically bound molecules; and detecting the hybridized target nucleic acid molecules (Column 3, line 39-Column 4, line 8 and Column 7, lines 21-64) wherein the paramagnetic labels are attached to the nucleic acid molecules using cleavable conjugating molecules i.e. selective binding molecules in a sandwich-type assay e.g. DNA tags (Column 4, lines 9-28 and Column 9, lines 16-33). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the cleavable nucleic acid-bead attachment of Basalt to the method of Blackburn et al thereby maximizing the number of targets detected with the least number of attachmcnts as taught by Basalt (Column 9, lines 21-32).

8. Claims 9-12 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blackburn et al (U.S. Patent No. 6,264,825, filed 23 June 1999) in view of Brown et al (U.S. Patent No. 5,807,522, filed 7 June 1995).

Regarding Claim 9, Blackburn et al disclose a method for increasing the hybridization rate of nucleic acids in a sample comprising attaching probe nucleic acid molecules of known sequence to a solid support, labeling nucleic acid target molecule with paramagnetic beads, attracting the labeled targets to the solid support by activating a magnetic field effective to induce rapid migration of the target, hybridizing the labeled target with their complementary pairs at a hybridization rate greater than the rate in the absence of the attracting field, washing the support and inverting the polarity of the magnetic field to remove unbound molecules and detecting the hybridized targets (Column 6, lines 30-60; Column 9, lines 31-61; Column 21, lines 20-65; and Column 38, line 61-Column 39, line13). Blackburn et al teach that the probe and target are both nucleic acids (Column 9, lines 31-61) but they do not specifically teach their method wherein the target is immobilized and the probe is labeled. However, Brown et al teach a similar method wherein the target is immobilized and the probe is labeled whereby a plurality of patient samples are simultaneously analyzed on the same solid support (Column 15, lines 19-47). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the target immobilization of Brown et al to the immobilized hybridization of Blackburn et al to thereby analyze a plurality of sample targets simultaneously for the expected benefit of rapid and convenient sample screening as taught by Brown et al (Column 15, lines 59-67).

Regarding Claim 10, Blackburn et al disclose the method wherein the solid support is selected from silicon, glass and metals (Column 14, lines 41-54).

Regarding Claim 11, Blackburn et al disclose the method wherein the solid support is coated with a metal selected from silver, copper gold, platinum, mercury, thallium, cadmium, and palladium (Column 14, line 41-Column 15, line 60).

Regarding Claim 12, Blackburn et al disclose the method wherein the paramagnetic labels have a diameter of from about 1 to about 10 nanometers (Column 21, lines 32-59).

Regarding Claim 15, Blackburn et al disclose the method wherein the nucleic acids are oligonucleotides, genomic DNA, cDNA, RNA or fragments thereof (Column 9, lines 11-30).

Regarding Claim 16, Blackburn et al disclose the method wherein at least one of the probe and target is labeled with a fluorescent detection molecule (Column 78, lines 25-35).

9. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blackburn et al (U.S. Patent No. 6,264,825, filed 23 June 1999) in view of Brown et al (U.S. Patent No. 5,807,522, filed 7 June 1995) as applied to Claim 9 above and further in view of Basalt (U.S. Patent No. 5,981,297).

Regarding Claims 6 and 14, Blackburn et al disclose a method for increasing the hybridization rate of nucleic acids in a sample comprising attaching probe nucleic acid molecules of known sequence to a solid support, labeling nucleic acid target molecule with paramagnetic beads, attracting the labeled targets to the solid support by activating a magnetic field effective to induce rapid migration of the target, hybridizing the labeled target with their complementary pairs at a hybridization rate greater than the rate in the absence of the attracting field, washing the support and inverting the polarity of the magnetic field to remove unbound molecules and detecting the hybridized targets (Column 6, lines 30-60; Column 9, lines 31-61; Column 21, lines 20-65; and Column 38, line 61-Column 39, line13) wherein the

nucleic acids are attached to the paramagnetic beads using known techniques (Column 19, lines 58-59) but they do not specifically teach cleavable conjugating attachment. However, Basalt teaches a similar method of nucleic acid hybridization comprising: attaching probe nucleic acid molecules of known sequence (i.e. binding molecules capable of undergoing selective binding with a target species, Column 4, lines 20-24)to a solid support; labeling nucleic acid target molecules with paramagnetic labels; contacting the labeled target molecules with the solid support; activating a magnetic field whereby the labeled molecules are attracted to the solid support (Column 7, lines 21-37); washing the support and inverting the polarity of the magnetic field to remove any unbound or non-specifically bound molecules; and detecting the hybridized target nucleic acid molecules (Column 3, line 39-Column 4, line 8 and Column 7, lines 21-64) wherein the paramagnetic labels are attached to the nucleic acid molecules using cleavable conjugating molecules i.e. selective binding molecules in a sandwich-type assay e.g. DNA tags (Column 4, lines 9-28 and Column 9, lines 16-33). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the cleavable nucleic acid-bead attachment of Basalt to the method of Blackburn et al thereby maximizing the number of targets detected with the least number of attachments as taught by Basalt (Column 9, lines 21-32).

10. Claims 1-3, 6, 7, 9-11, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baselt (U.S. Patent No. 5,981,297, filed 5 February 1997) in view of Blackburn et al (U.S. Patent No. 6,264,825, filed 23 June 1999).

Regarding Claim 1, Baselt discloses a method of nucleic acid hybridization comprising: attaching probe nucleic acid molecules of known sequence (i.e. binding molecules capable of undergoing selective binding with a target species, Column 4, lines 20-24)to a solid support; labeling nucleic acid target molecules with paramagnetic labels; contacting the labeled target molecules with the solid support; activating a magnetic field whereby the labeled molecules are attracted to the solid support (Column 7, lines 21-37); washing the support and inverting the polarity of the magnetic field to remove any unbound or non-specifically bound molecules; and detecting the hybridized target nucleic acid molecules (Column 3, line 39-Column 4, line 8 and Column 7, lines 21-64) wherein the method operates faster than other techniques (Column 4,lines 35-38) but they do not teach attracting the target molecules to the support by activating a magnetic field effective to induce rapid migration of the labeled probes. However, Blackburn et al teach a similar method wherein a magnetic field is activated to induced rapid migration of the labeled target to thereby concentrate the target at the probe and increase the rate of hybridization by 50 to 100 fold (Column 17, lines 58-63; Column 19, lines 29-65; and Column 21, lines 20-67). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the method of Baselt by attracting the target to the support thereby concentrating the target as taught by Blackburn et al (Column 19, lines 29-65; and Column 21, lines 20-67) for the expected benefit of increasing the rate of hybridization by 50 to 100 fold (Blackburn et al (Column 17, lines 58-63).

Regarding Claim 2, Baselt et al disclose the solid support is silicon (Column 6, lines 32-36).

Regarding Claim 3, Baselt et al disclose the solid support is coated with gold (Column 6, lines 47-50).

Regarding Claim 6, Baselt et al disclose the paramagnetic labels are attached to the nucleic acid molecules using cleavable conjugating molecules i.e. selectivc binding molecules (Column 4, lines 23-28).

Regarding Claim 7, Baselt et al disclose the nucleic acid molecules are oligonucleotides or DNA (Column 4, lines 3-5).

Regarding Claim 9, Baselt disclose a method of nucleic acid hybridization comprising: attaching probe nucleic acid molecules to a solid support; labeling nucleic acid target molecules of known sequence (i.e. target species capable of selective binding, Column 4, lines 20-24) with paramagnetic labels; contacting the labeled target molecules with the solid support; activating a magnetic field whereby the labeled molecules are attracted to the solid support (Column 7, lines 21-37); washing the support and inverting the polarity of the magnetic field to remove any unbound or non-specifically bound molecules; and detecting the hybridized target nucleic acid molecules (Column 3, line 39-Column 4, line 8 and Column 7, lines 21-64) wherein the method operates faster than other techniques (Column 4,lines 35-38) but they do not teach attracting the target molecules to the support by activating a magnetic field effective to induce rapid migration of the labeled probes. However, Blackburn et al teach a similar method wherein a magnetic field is activated to induced rapid migration of the labeled target to thereby concentrate the target at the probe and increase the rate of hybridization by 50 to 100 fold (Column 17, lines 58-63; Column 19, lines 29-65; and Column 21, lines 20-67). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the method of Baselt by attracting the target to the support thereby concentrating the target as taught by Blackburn et al (Column 19, lines 29-65; and Column 21, lines 20-67) for the expected benefit of increasing the rate of hybridization by 50 to 100 fold (Blackburn et al (Column 17, lines 58-63).

Regarding Claim 10, Baselt et al disclose the solid support is silicon (Column 6, lines 32-36).

Regarding Claim 11, Baselt et al disclose the solid support is coated with gold (Column 6, lines 47-50).

Regarding Claim 13, Baselt et al disclose the paramagnetic labels are attached to the nucleic acid molecules using cleavable conjugating molecules i.e. selective binding molecules (Column 4, lines 23-28).

Regarding Claim 14, Baselt et al disclose the nucleic acid molecules are oligonucleotides or DNA (Column 4, lines 3-5).

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

12. No claim is allowed.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (703) 306-5878. The examiner can normally be reached on 6:30 TO 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on (703) 308-1119. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-4242 for regular communications and (703) 308-8724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

BJ Forman, Ph.D.
Patent Examiner
Art Unit: 1634
July 29, 2003